

field, and impart stress to the piezoelectric layer to produce a detectable voltage signal in the piezoelectric layer; and

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a circuit coupled to the piezoelectric layer for detecting the voltage signal, wherein during operation the magnetic field sensor does not consume any external electrical power.

4. (Amended) A magnetic field sensor comprising:

a multilayer structure consisting essentially of two layers of piezoelectric material sandwiching one layer of magnetostrictive material, the layer of magnetostrictive material arranged to strain in the presence of an alternating magnetic field and impart stress to the piezoelectric layers to produce a detectable voltage signal in the piezoelectric layers; and

a circuit coupled to the piezoelectric layers for detecting the voltage signal, wherein during operation the magnetic field sensor does not consume any external electrical power .

5. (Amended) A magnetic field sensor as described in Claim 3, wherein a sensitivity of the sensor is proportional to a thickness of the piezoelectric layer and substantially independent of an area of the sensor when the circuit comprises a high impedance readout circuit.

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7. (Amended) A magnetic field sensor comprising a substrate of magnetostrictive material and a thin layer of piezoelectric material over the substrate, the magnetostrictive substrate straining under the influence of a magnetic field and imparting stress to the layer of piezoelectric material to produce a detectable voltage.

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9. (Amended) A magnetic field sensor comprising a substrate of magnetostrictive material that strains under the influence of a magnetic field and imparts stress to at least one patterned stripe of piezoelectric material on the substrate to produce a detectable voltage.

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17. (Amended) An electromagnetic field sensor comprising:  
a multilayer structure consisting essentially of two layers of a first material sandwiching one layer of a second material, wherein the first material comprises one of a magnetostrictive material and a piezoelectric material, and the second layer comprises the other one of a magnetostrictive material and a piezoelectric material, the magnetostrictive material being arranged to strain under the influence of a magnetic field and impart stress to the piezoelectric material to produce a detectable voltage signal; and  
a circuit coupled to the multilayer structure for detecting the voltage signal, wherein during operation the magnetic field sensor does not consume any external electrical power .

18. (Amended) A magnetic field sensor array, comprising: a one dimensional array of magnetic field sensors, each field sensor comprising layers of magnetostrictive and piezoelectric material, the magnetostrictive material straining under the influence of a magnetic field and imparting stress to the piezoelectric material to produce a detectable voltage signal; and a read-out circuit coupled to each sensor for detecting the voltage signal of each one of the magnetic field sensors.

19. (Amended) A magnetic field sensor array, comprising: a multi-dimensional array of magnetic field sensors, each field sensor comprising layers of magnetostrictive and piezoelectric material, the magnetostrictive material straining under the influence of a magnetic field and imparting stress to the piezoelectric material to produce a detectable voltage signal; and a read-out circuit coupled to each sensor for detecting the voltage signal of each one of the magnetic field sensors.

20. (Amended) A motion speed detection system, comprising a magnetic wheel mounted on a shaft of motor, the magnetic wheel arranged to produce a varying magnetic field near to the magnetic wheel as the wheel rotates on the shaft; and a sensor located near to the magnetic wheel comprising a magnetostrictive material that strains under the influence of the varying magnetic field induced by rotation of the magnetic wheel, the